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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,316	09/26/2001	Tod S. Heiles	10019633-1	9922

7590 09/14/2006

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EXAMINER	
HUFFMAN, JULIAN D	

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/964,316	HEILES ET AL.	
	Examiner	Art Unit	
	Julian D. Huffman	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-18,20-27,29-42,44,45 and 48-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-18,20-27,29-42,44,45 and 48-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4-18, 20-27, 29-42, 44, 45 and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subirada et al. (U.S. 20020126171 A1) in view of Beauchamp et al. (5,448,269).

With regards to claims 1, 16 and 18, Subirada et al. discloses a printing device (fig. 16), comprising:

a pen (fig. 17, elements 223-226) configured to move in a carriage direction back and forth over a width of a print media to transfer an imaging medium onto the print media to form printed diagnostic images (figs. 1 and 4) which includes printing first swath images (fig. 4a, 11-14, 31-34, 21-24, 41-44) on the print media, advancing the print media, and printing second swath images (11'-14', 31'-34', 21'-24', 41'-44') on the print media, the first swath images and the second swath images being printed to form the printed diagnostic image (fig. 4a, 0173-0179);

a sensor (fig. 17, element 251) configured to scan along a horizontal axis of the print media to detect pen swath optical densities from non-printed space of the print media and the printed diagnostic images (0172, 0180, 0181, 0330), the pen swath optical density of a printed diagnostic image being detected from the at least first print swath

image, the second print swath image, and the non-printed space of the print media proximate the at least first print swath image and the second print swath image (fig. 4a, 0178, 0180);

an application component (fig. 18, element 71) configured to determine an error compensation factor from the pen swath optical densities of the printed diagnostic images (0157, 0158, the value PBF, which is calculated from density data obtained by the optical sensor for each pen, is a factor which is used to compensate for line feed advance error, 0258-0262), the application component further configured to determine a print media line feed advance offset (Ap) from the pen swath height error compensation factor (0258, the value Ap is calculated using the PBF value for each pen).

With regards to claims 26 and 42, Subirada et al. discloses a method and a computer-readable media storing instructions to execute the method (0340), to correct printing mechanism swath height and line-feed advance errors, comprising:

printing a diagnostic image on a print media by moving a pen in a carriage direction back and forth over a width of the print media, the diagnostic image formed with first swath images and second swath images (fig. 4a);

detecting pen swath optical densities from non-printed space of the print media and the diagnostic image by scanning along a horizontal axis relative to the swath images/of the print media, the pen swath optical densities being detected from the first swath images, the second swath images, and the non-printed space of the print media proximate the first swath images and the second swath images (fig. 4a, 0172, 0178, 0180, 0181, 0330);

determining an error compensation factor and a pen swath height (calculating the density of the printed images is equivalent to determining pen swath height since overlap of swaths increases the density and therefore decreases the swath height, while too much space between swaths decreases the density and increases the swath height) from the pen swath optical densities of the diagnostic image (0258, Ap); and

offsetting a print media line-feed advance corresponding to the error compensation factor (0258).

With regards to claims 37 and 44, Subirada et al. discloses a method and computer-readable media for executing the method (0340), to determine a printing device media line-feed advance offset, comprising:

printing first swath images, advancing the print media, and printing second swath images (fig. 4a, 0173, 0216) by moving a pen in a carriage direction back and forth over a width of a print media;

detecting a first optical density correlating to a first offset between the first swath images and corresponding second swath images by scanning along a horizontal axis relative to the swath images (0172, 0173, 0181, sensor detects offset between first swath and second swath), the first optical density being detected from the first swath images, the second swath images, and non-printed space proximate the first swath images and the second swath images (0178);

detecting at least a second optical density correlating to a second offset between the first swath images and corresponding second swath images by scanning along the horizontal axis relative to the swath images, the second optical density being detected from the first swath images, the second swath images, and non-printed space proximate the first swath images and the second swath images (fig. 4a, 0173, 0181, sensor

detects offset between first and second swaths for each set of first and second swaths, printed with different colors and different advance amounts);

determining the printing device media line-feed advance offset from the detected optical densities (0258).

With regards to claim 41, Subirada et al. discloses detecting multiple optical densities correlating to multiple different offsets between the first swath images and the second swath images (0173), and wherein determining includes determining an optimal density from the detected multiple optical densities (0258).

With regards to claims 17, 27 and 45, multiple sets (4) of diagnostic images are formed and detected (figs. 1 and 4A).

With regards to claims 7-10, 20-22, 29-32 and 48-50 the pen is configured to form the diagnostic image with first print swath images and second print swath images (figs. 1 and 4A), wherein the second print swath images are printed after the first print swath images and after a media line-feed advance (0173) and wherein the sensor is configured to detect alignment, overlap and offset of the first and second print swath images.

With regards to claim 4, the image has overlapping swath images (abstract, 0178).

With regards to claims 5 and 6, the sensor is further configured to detect pen swath optical densities from multiple sets of print swath images that form each of the printed diagnostic images, each set of print swath images printed at a different print media line-feed advance offset and having a different detectable spacing component (0173).

With regards to claims 11, 23, 33, 38 and 51 the application component is configured to average multiple pen swath optical densities to determine the pen swath height error compensation factor and print media line-feed advance offset (fig. 18, the

circuit 71 processes all of the calculations to control the line feed advance, which is calculated using a weighted mean calculated from the values of each pen, 0258).

With regards to claim 39, since the optical density value is used to determine the PBF value for each pen, one of these values must have a lowest value, and this lowest value is therefore selected in the process of calculating the PBF value. With regards to claim 40, since the pattern is printed using each of the pens (0170-0173), printing includes printing the first and second swath images with one pen to form the diagnostic image. The claim language does not state that only one pen is used.

With regards to claims 12, 13, 24, 34, 35 and 52 the device further comprises at least a second pen (fig. 17) configured to transfer the imaging medium onto the print media to form second printed diagnostic images that each include print swath images (0173, fig. 4a), wherein:

the sensor is configured to scan along the horizontal axis of the print media to detect second pen swath optical densities from additional non-printed space of the print media and the second printed diagnostic images, the second pen swath optical densities of the second printed diagnostic images being detected from the print swath images of the second pen and the additional non-printed space of the imaging medium proximate the print swath images of the second pen (0180);

the application component is further configured to determine a second error compensation factor (PBF) from the second pen swath optical densities of the second printed diagnostic images (0258, the PBF is calculated for each pen);

the application component is further configured to determine an optimal error compensation factor (Ap) from the error compensation factor and the second error compensation factor (0258, the PBF value for each pen is

summed in the formula to arrive at an optimal error compensation value Ap); and

the print media line-feed advance is further configured to be offset corresponding to the optimal error compensation factor (0258, the advance is offset corresponding to the value Ap, which is the optimal error compensation value).

With regards to claims 14, 15, 25 and 36, the formula averages the optical densities of the first and second pens to calculate the offset since it determines an averaged error compensation factor (0258, the formula averages the PBF values, which represent the optical densities of the image, to find the optimal offset).

Subirada et al. does not disclose the sensor configured to scan in the carriage direction over the print media to detect pen swath optical densities.

However, Beauchamp et al. discloses that a sensor may scan in either the carriage scan axis or the media scan axis (column 6, lines 39-41).

It would have been obvious to one having ordinary skill in the art at the time of the invention to scan the sensor in the carriage scan direction for the purpose of increasing the lifetime of the media scan motor and enabling scanning and printing in the same pass.

Response to Arguments

3. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendment.

Conclusion

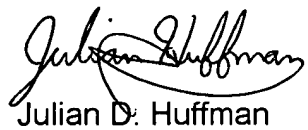
4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Julian D. Huffman
Art Unit 2853
11 September 2006